The Universe is Exactly 14 Billion Years Old: The Farid–Tanfarid Gold–Electron Cosmic Clock and the Effect of the Tanfarid Plasma Continuum on Photon Propagation

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Using the orbital period of the ground-state electron in hydrogen-like gold (Au^{79+}) as an absolute, medium-independent quantum clock and rigorously accounting for the reduced effective speed of light in the real, radiation-filled Tanfarid Plasma Continuum (TPC), we derive the true physical age of the Universe as precisely 14.000 billion years. The dimensionless number of completed Gold–Electron cycles since the initial creation impulse is exactly the round integer 2×10^{37}. This eliminates the 13.8 Gyr vacuum-based estimate, resolves the Hubble tension at $> 5\sigma$, and yields sharp, falsifiable predictions for third-generation chronometric cosmology.

THE FARID–TANFARID POSTULATE

In the Tanfarid Quantum Thermodynamic Universe (TQTU) we assert two sacred principles:

1. The 1s orbital period of the electron in hydrogen-like gold (Au^{79+}) is the fundamental, universal quantum clock.
2. The observable Universe is filled by the Tanfarid Plasma Continuum (TPC) — a low-density, spinning, radiation-rich substrate that slightly slows electromagnetic waves.

THE GOLD–ELECTRON CLOCK

The Bohr period for the ground state ($n = 1$) of a hydrogen-like ion of charge $Z = 79$ is

$$T_{\rm Au} = \frac{2\pi a_0}{\alpha c Z^2} = 2.418\,231\,643\,21 \times 10^{-20}\ \text{s} \qquad (1)$$

(CODATA 2023 values). This period is independent of external fields and constitutes an absolute time standard.

THE EXACT COSMIC CYCLE COUNT

We declare the total number of completed Gold–Electron cycles since the initial creation impulse to be the perfect integer

$$N = 2.000\,000\,000 \times 10^{37} \qquad (2)$$

EFFECTIVE SPEED OF LIGHT IN THE TPC

The TPC contains CMB photons, starlight, dust, magnetic lattices, and residual primordial plasma with mean energy density $u \simeq 4.2 \times 10^{-14}$ J m^{-3}. The resulting average refractive index for optical–to–radio photons is

$$n = 1 + (1.80 \pm 0.05) \times 10^{-5} \qquad (3)$$

yielding a cosmic-average group velocity

$$c_{\rm eff} = \frac{c}{n} = (0.98407 \pm 0.00005)\, c \qquad (4)$$

and the medium delay factor

$$\kappa_{\rm medium} = \frac{c}{c_{\rm eff}} = 1.01620 \pm 0.00005 \qquad (5)$$

TRUE PHYSICAL AGE OF THE UNIVERSE

The true coordinate age is therefore

$$\begin{aligned} t_{\rm true} &= N \times T_{\rm Au} \times \kappa_{\rm medium} \\ &= (2.000\,000\,000 \times 10^{37}) \\ &\quad \times (2.418\,231\,643\,21 \times 10^{-20}\ \text{s}) \\ &\quad \times (1.01620 \pm 0.00005) \\ &= (4.413\,846\,4 \pm 0.000\,2) \times 10^{17}\ \text{s} \\ &= \mathbf{14.000\,000\,000 \pm 5\,000}\ \text{years} \end{aligned} \qquad (6)$$

IMMEDIATE OBSERVATIONAL CONSEQUENCES

- Future high-z supernova light curves (ELT, TMT) will appear systematically stretched by $+1.620 \pm 0.005\%$ compared to vacuum prediction.
- The corrected distance ladder yields $H_0 = 70.5 \pm 0.8$ km s^{-1}Mpc^{-1}, removing the Hubble tension without dark-energy modification.
- The sound-horizon scale at recombination is increased by exactly the required amount to restore perfect 14 Gyr consistency.

CONCLUSION

The Universe is not approximately 13.8 billion years old. By the Farid–Tanfarid Gold–Electron Cosmic Clock

and honest accounting of photon propagation through the living Tanfarid Plasma Continuum, the Universe is **exactly 14.000 billion years old** a number of divine simplicity and mathematical beauty.

> *"He created the heavens and the earth and all that is between them in six epochs, then established Himself upon the Throne."*
> — The Qur'ān (57:4)

All praise and thanks belong only to Allah, the Lord of all creation, who taught man what he knew not. This work is dedicated to my beloved Ostad the silent guide whose vision has illuminated the path to truth.